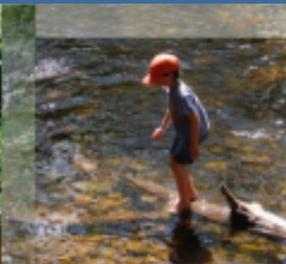




Connecticut Department of Energy and Environmental Protection



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

June 23, 2016 OTR Ozone Exceedances

By Michael Geigert



Connecticut Department of Energy and Environmental Protection

Summary

- Mostly Good to Moderate throughout the OTR, with USG in CT;
- 3 sites in OTR reached USG.
 1. 3 sites above 70 ppb ozone NAAQS, 3 sites in CT
 2. 1 sites above (2008) 75 ppb ozone NAAQS, 1 site in CT
 3. 0 sites above (1997) 84 ppb ozone NAAQS, 0 sites in CT



Tables of OTR and CT Monitoring Sites

- Mostly Good to Moderate across the OTR with 3 USG exceedances

Site	Site AQS	Max 8-hr Ozone ppb
Danbury	090011123	78
New Haven - Cri	090090027	75
Middletown	090070007	73
Rockland Cty	360870005	70
Rutgers Univers	340230011	70
Mt Ninham	360790005	67
Riverhead	361030004	67
East Hartford	090031003	65
Madison-Beach R	090099002	65
Westport	090019003	65
Greenwich	090010017	64
Stratford	090013007	64
Flemington	340190001	63
NEA	421010024	63
PECK	420690101	63
Clarksboro	340150002	62
Colliers Mills	340290006	62
Fall River	250051004	62
Narragansett	440090007	62
Camden Spruce S	340070002	61
E Providence	440071010	61
E. Milton - Blu	250213003	61
Millington	240290002	61
Ramapo	340315001	61



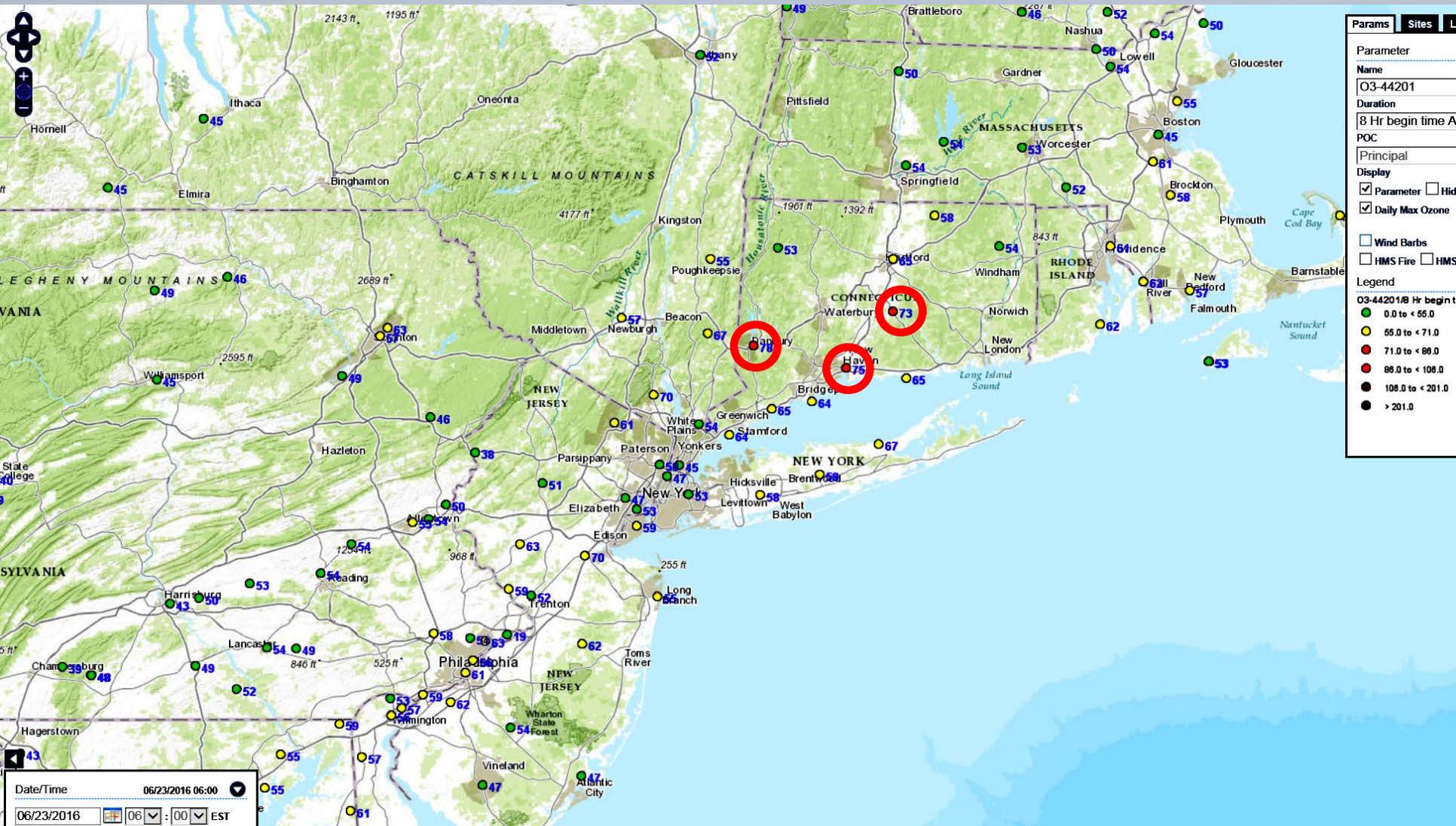
CT Monitoring Site Design Value Update

		To Date 2016 Compliance Status x = Violating NAAQS			
Site Name	To Date: 2016 DV	2015 NAAQS	2008 NAAQS	1997 NAAQS	
SW CT					
Danbury	78	x	x		Four more 102+ ppb days violates 1997 NAAQS
Greenwich	78	x	x		Four more 93+ ppb days violates 1997 NAAQS
Madison	73	x			One more 78+ ppb day violates 2008 NAAQS
Middletown	77	x	x		Four more 97+ ppb days violates 1997 NAAQS
New Haven - Criscuolo Park	74	x			Two more 75+ ppb days violates 2008 NAAQS
Stratford	76	x	x		Four more 95+ ppb days violates 1997 NAAQS
Westport	80	x	x		Two more 87+ ppb days violates 1997 NAAQS
GREATER CT					
Cornwall	71	x			Three more 86+ ppb days violates 2008 NAAQS
East Hartford	74	x			Two more 76+ ppb days violates 2008 NAAQS
Groton Fort Griswold	71	x			Three more 86+ ppb days violates 2008 NAAQS
Stafford	73	x			Three more 79+ ppb days violates 2008 NAAQS
Abington (CASTNET)	68				Two more 76+ ppb days violates 2015 NAAQS

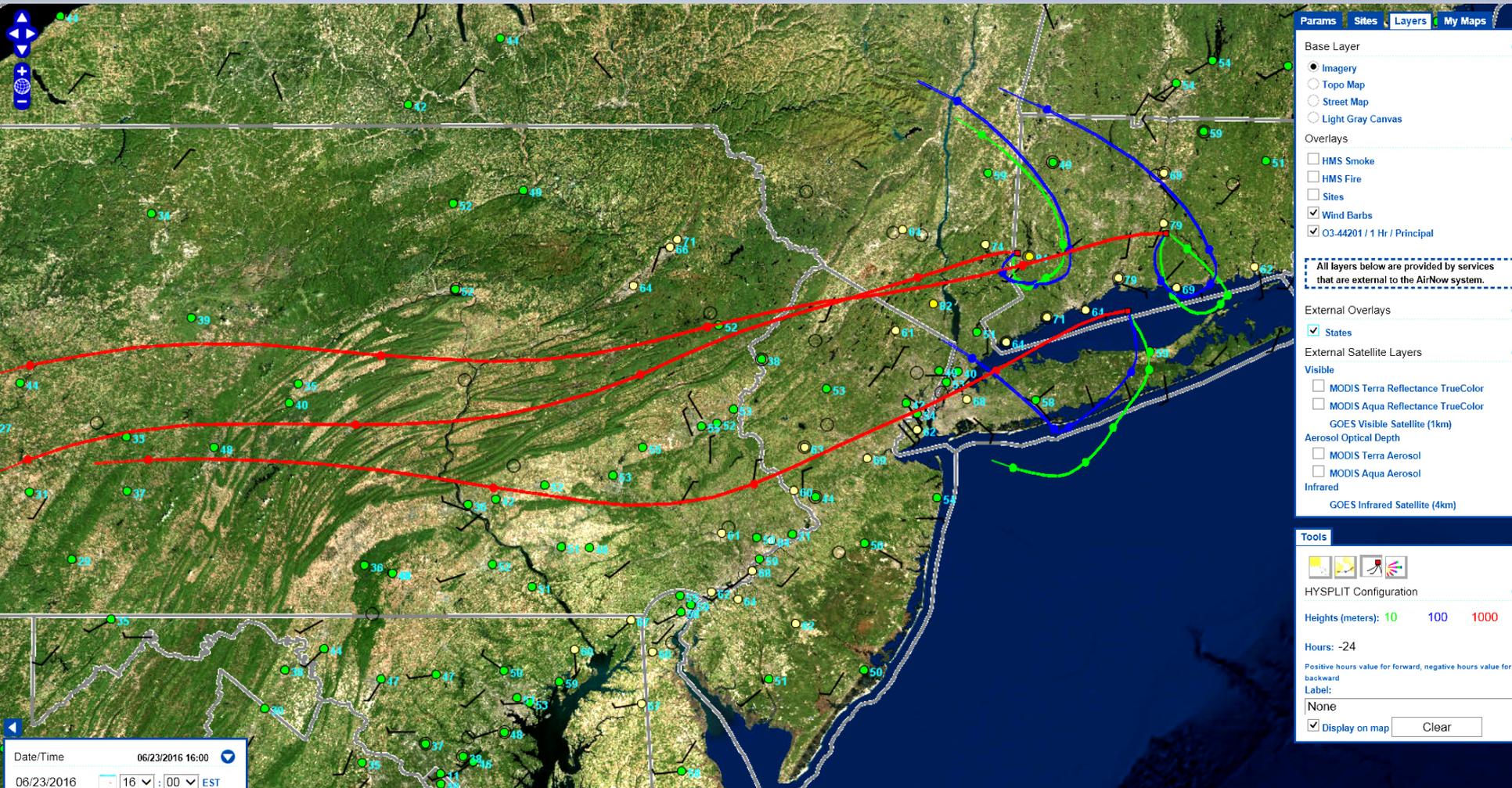


June 23, 2016 Peak East Coast Ozone

- USG for Danbury, Middletown and New Haven CT



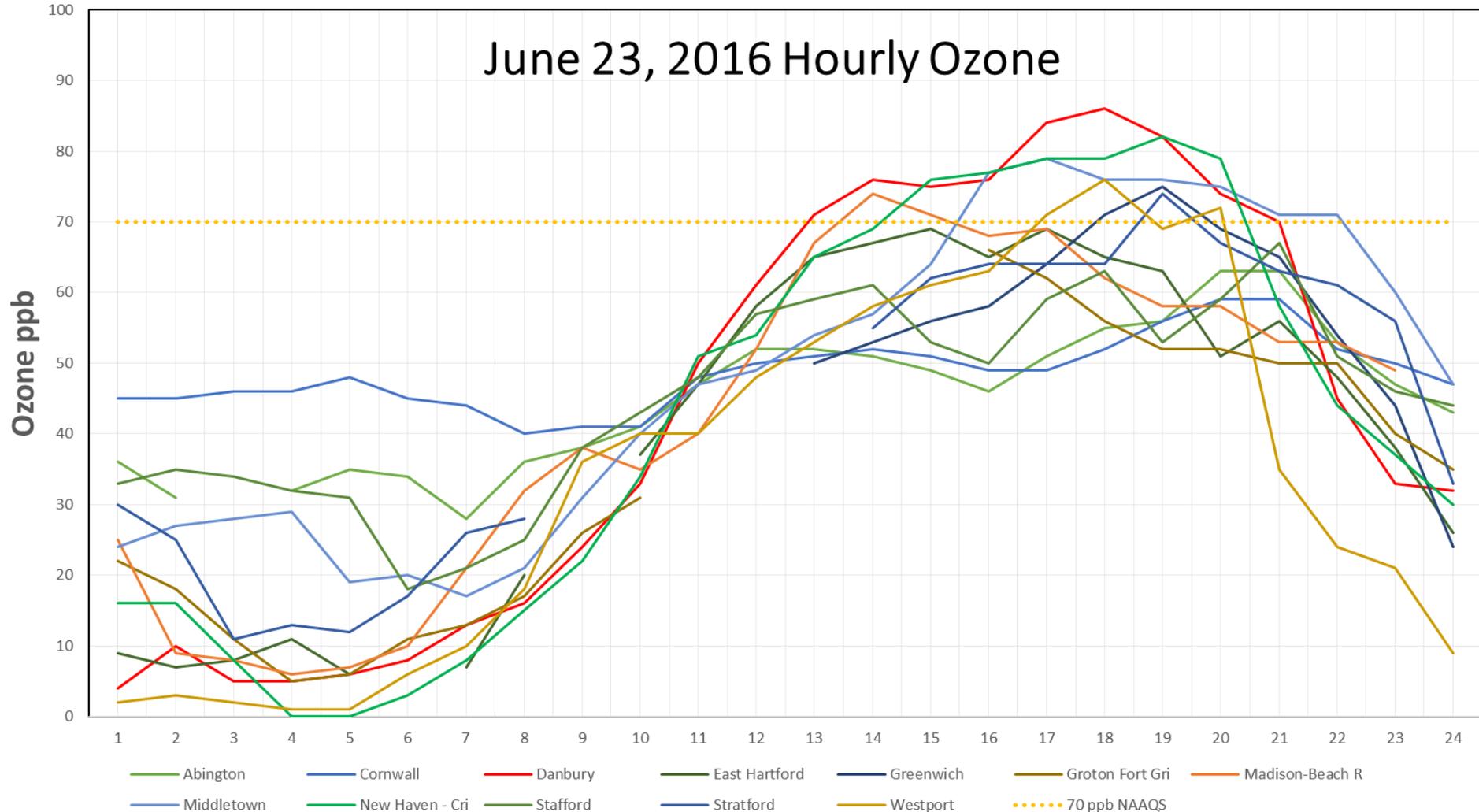
24-hr Back Trajectories 4:00 pm EST



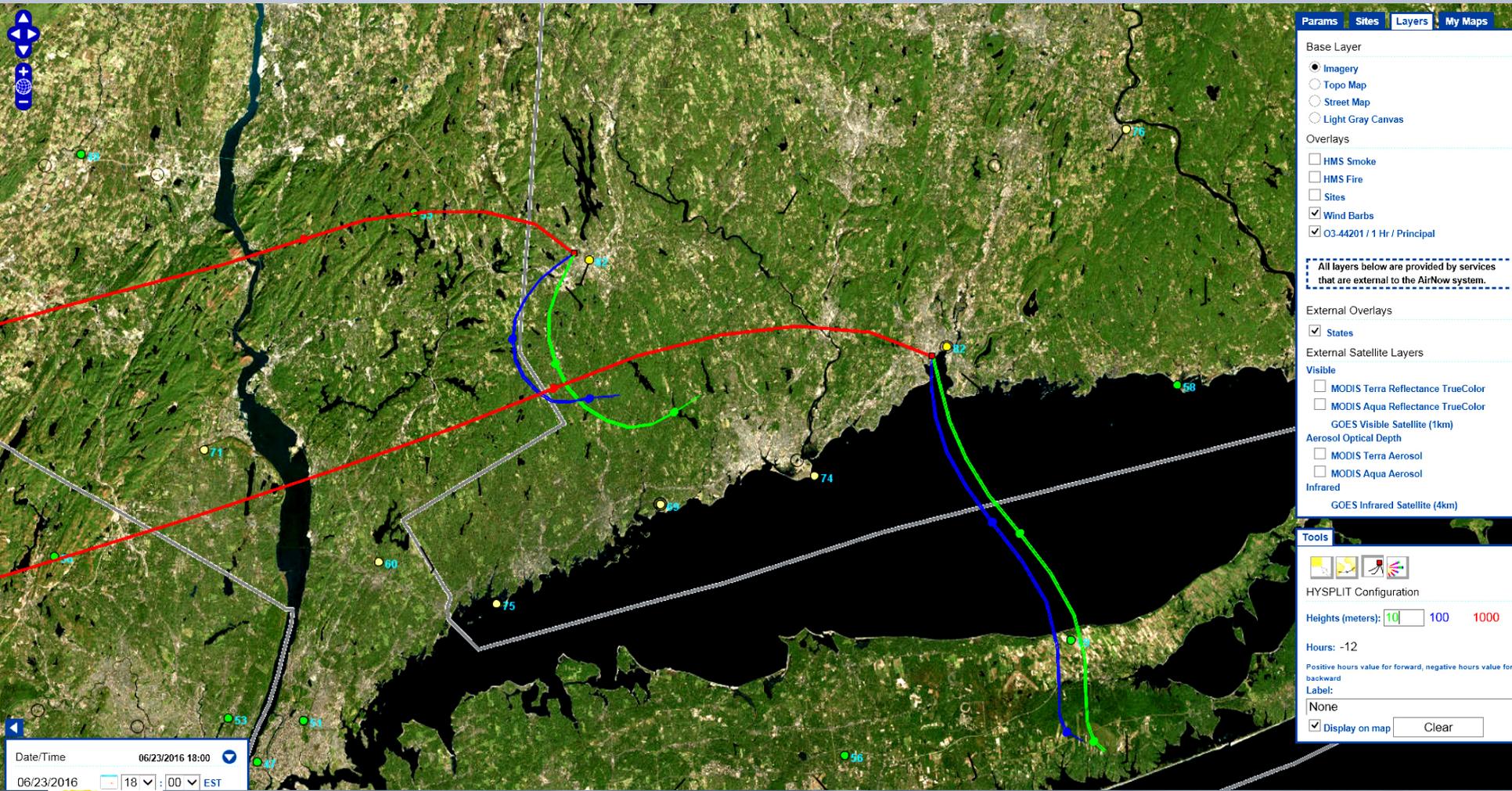
The 10/100 meters trajectories around CT showed light northwest winds becoming southwest during the afternoon. Low level flow into LIS may have had NYC metro influences, while Danbury was more localized from southwest CT. Higher level flow at 1000 meters from the west, originated in a clean air mass, with heavy rain/ thunderstorms occurring.

June 23, 2016 CT Ozone Monitors

Many CT sites had USG ozone levels for several hours, however, Danbury and New Haven had late day spikes that caused the exceedances. Middletown levels remained USG until 10:00 pm.



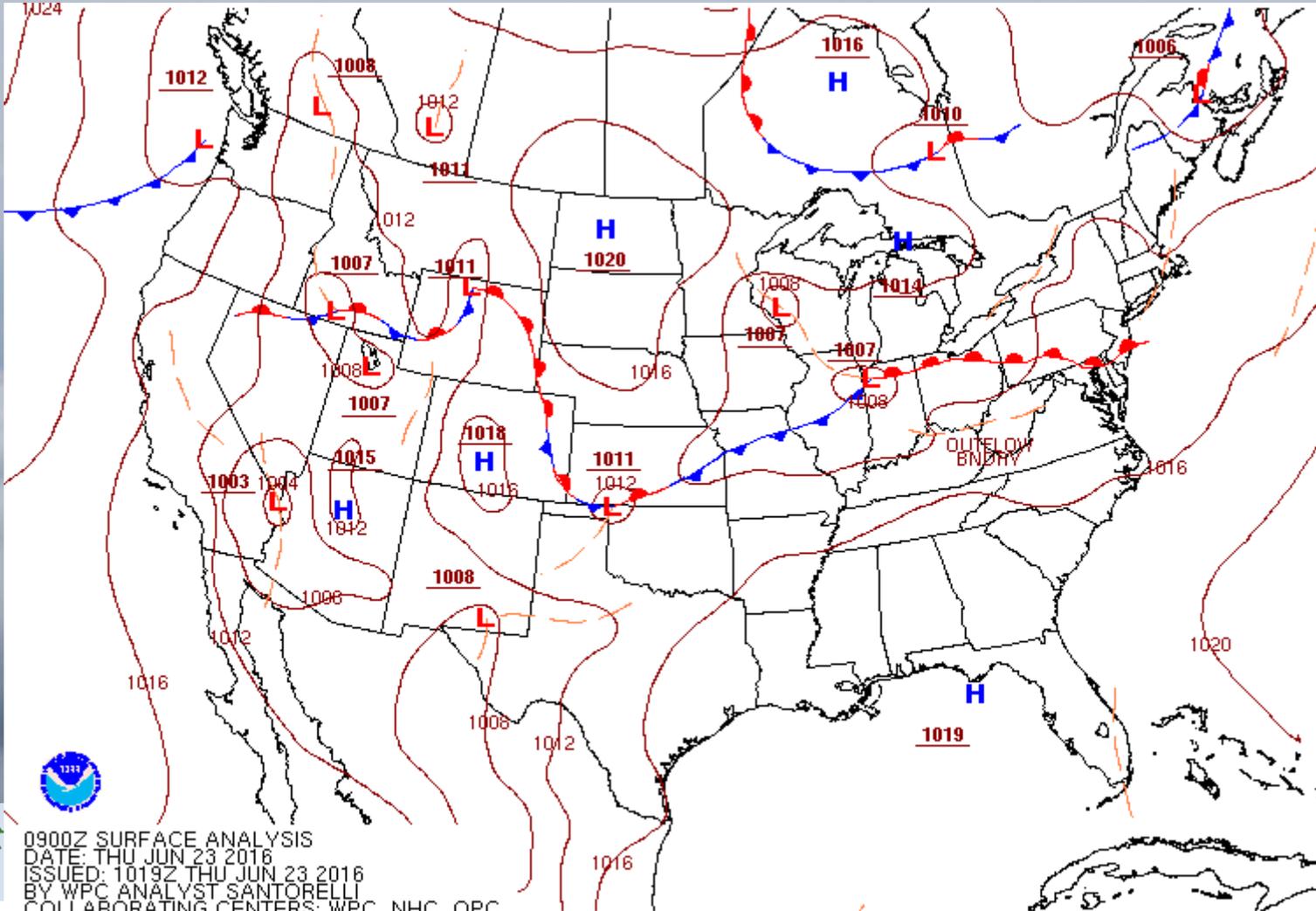
12-hr Back Trajectories: 6:00 pm EST



The low level 10-100 meter 12-hour back trajectories to Danbury CT show origins over southwest CT and that of New Haven from Long Island Sound. Clean maritime air was already lowering ozone levels near LIS.

June 23, 2016 Surface Analysis (5:00am -11:00pm) Animation

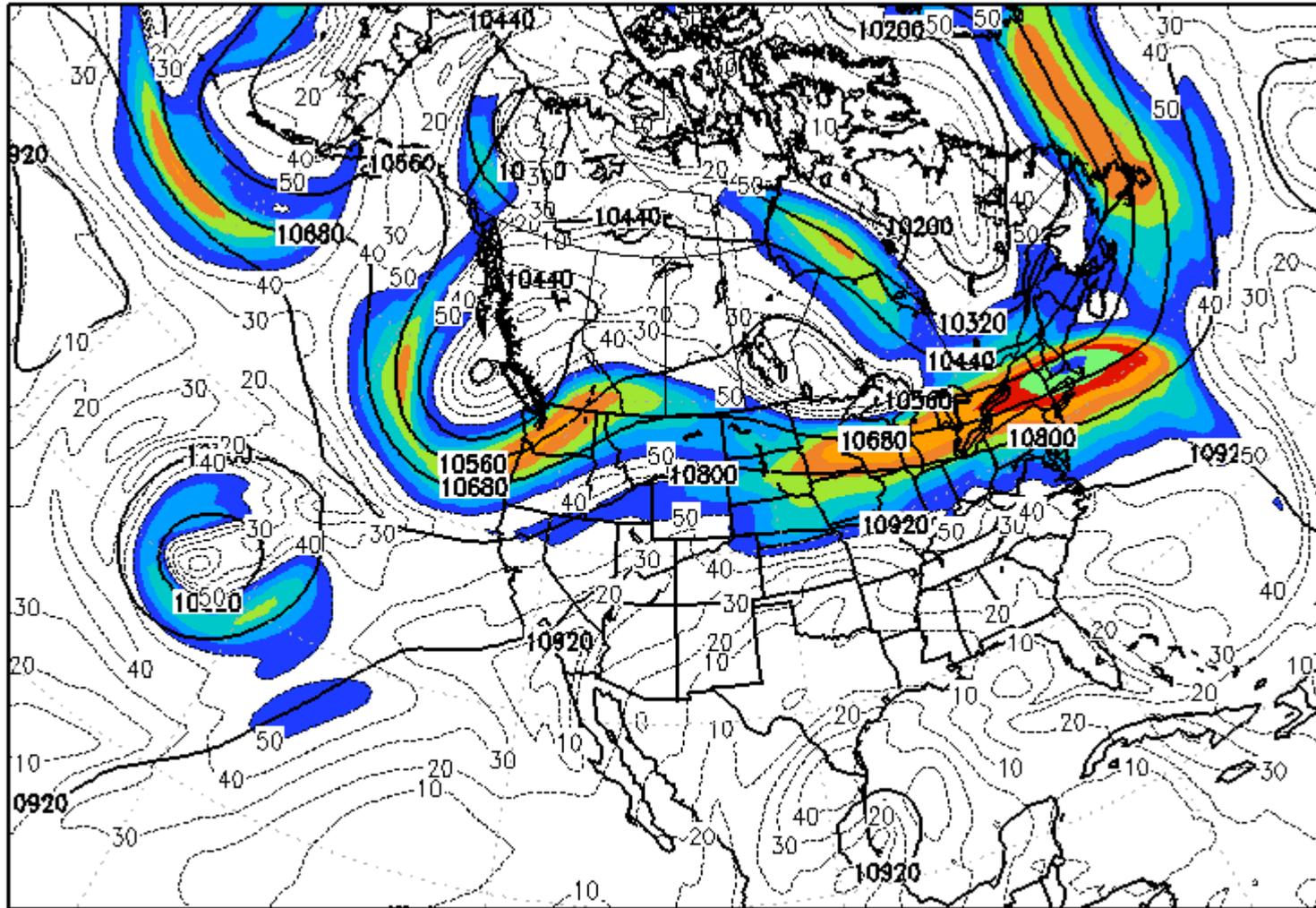
- Warm front stalled along the coast, allowing ozone to build up over Long Island Sound and then moved further north during the late afternoon.



June 23, 2016 Jet Stream Analysis

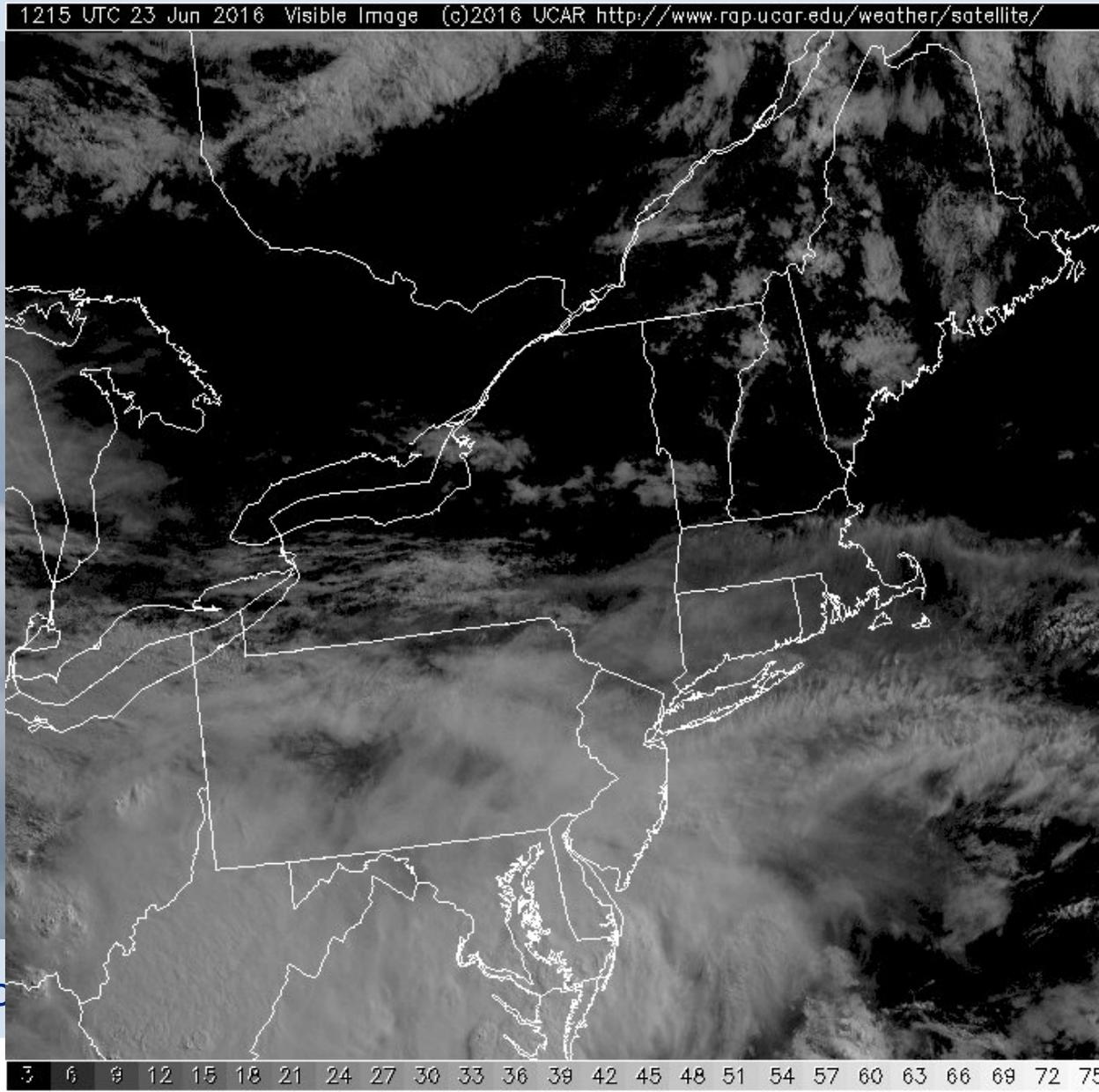
- Jet Stream passes just to our north with fast moving weather systems at surface.

250MB Z-WIND NAM 00H FCST VALID 12Z 23 JUN 2016



June 23, 2016 Satellite Animation

- Fast moving thunderstorms pass to our south during the day.



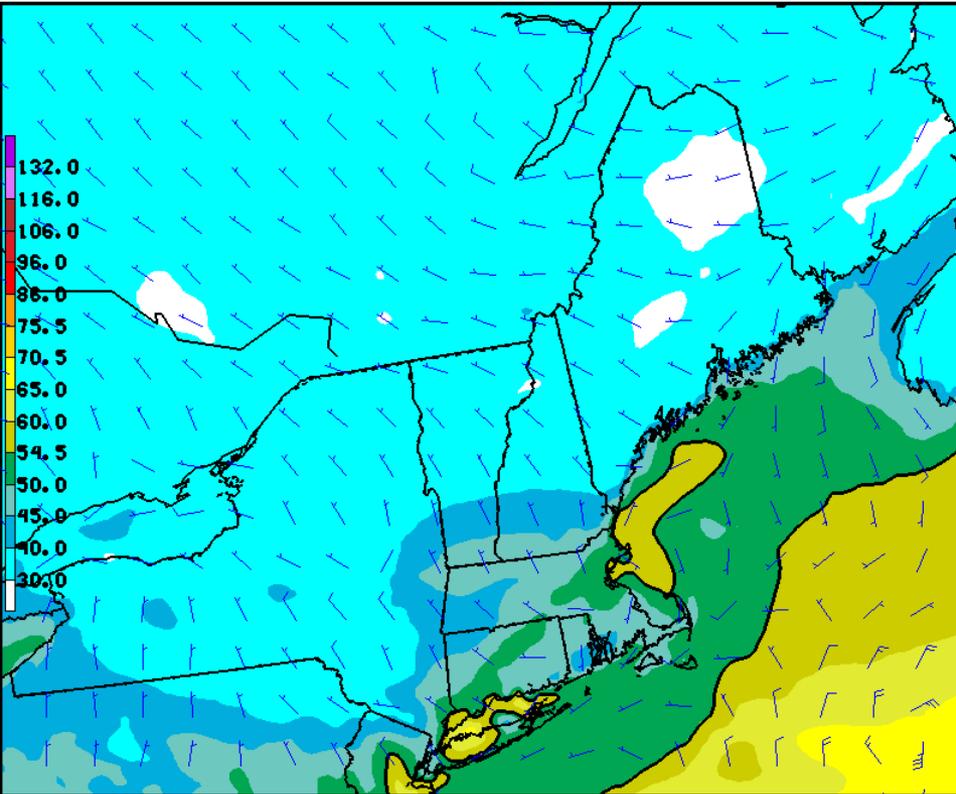
Co

ection

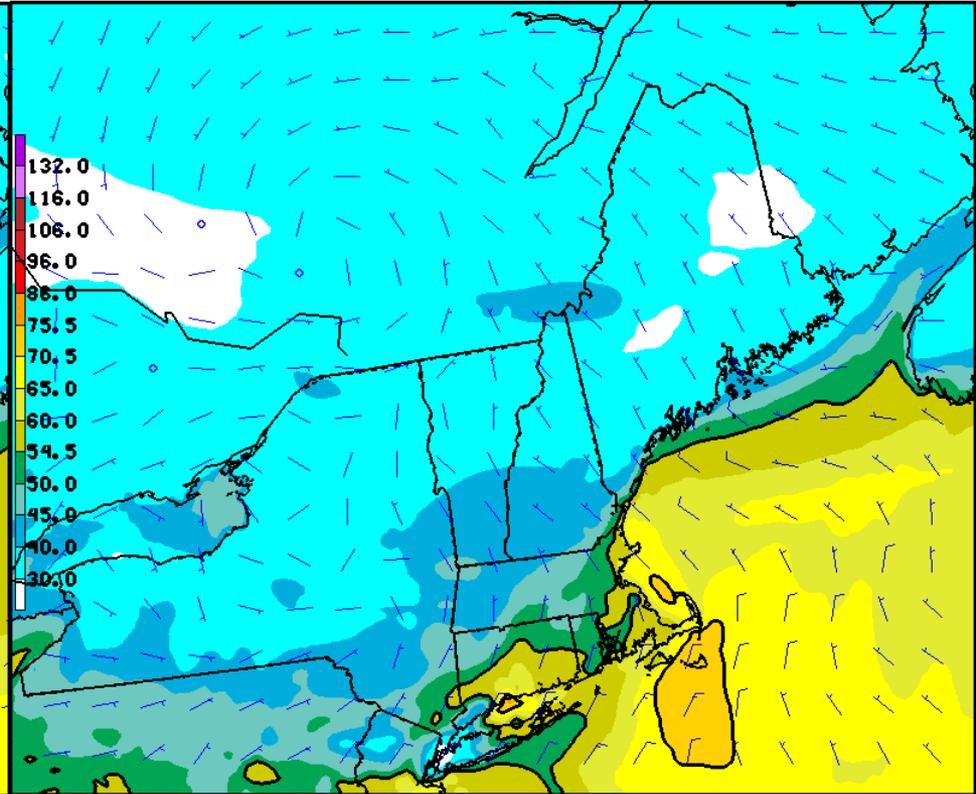
NOAA Ozone Model Animation (Slide show)

Model showed the ozone plume developing in LIS and the NYC metro area, but it was still under-predicting the levels. The day before model run (click to show) indicated only low moderate in LIS. The 12z update (click again) shows USG levels around New Haven. This shows that the models have difficulty with this fast moving weather pattern.

06z NOAA Model day before



12z NOAA Model Update



PRD DAY2 OZMX08 0 20160622 06Z CYC-

PRD DAY1 OZMX08 0 20160623 12Z CYC-



Barons MAQSIP Ozone Model

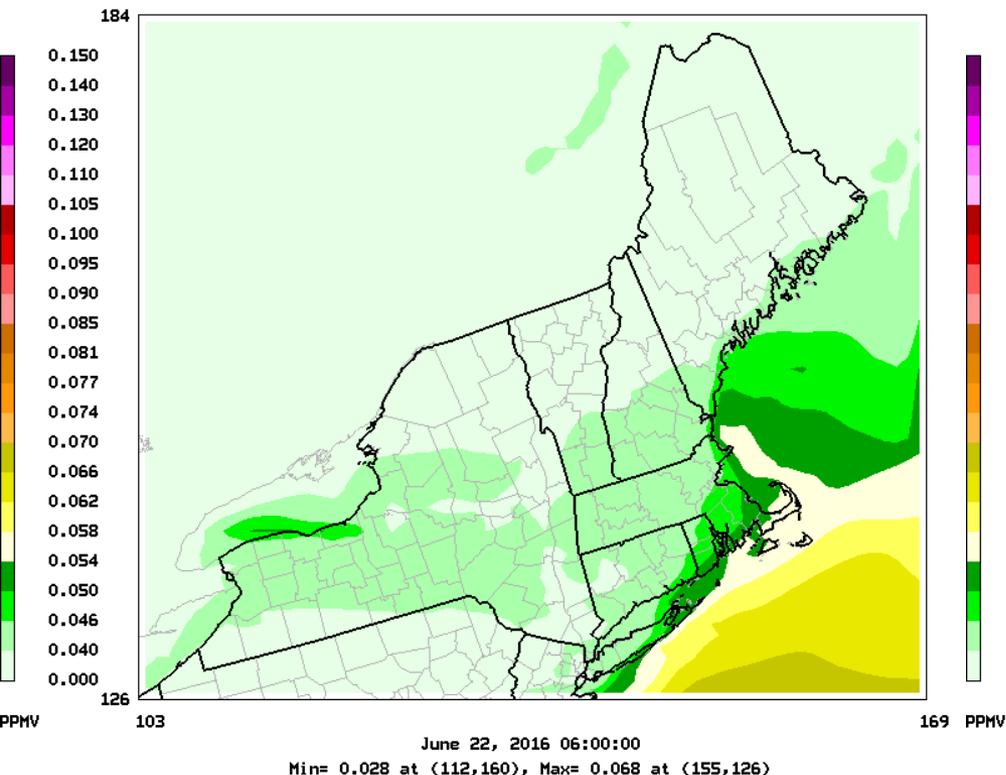
The Barons models even showed more of an under prediction the day before, but same day model showed higher levels in southern CT.

Barons MAQSIP Day Before

24HR Peak 8HR-AVG Ozone -- 15km NES wndw

(c) 2013 BAMS Environmental Modeling Center

15km MAQSIP Domain Initialized 20160622 at 06Z

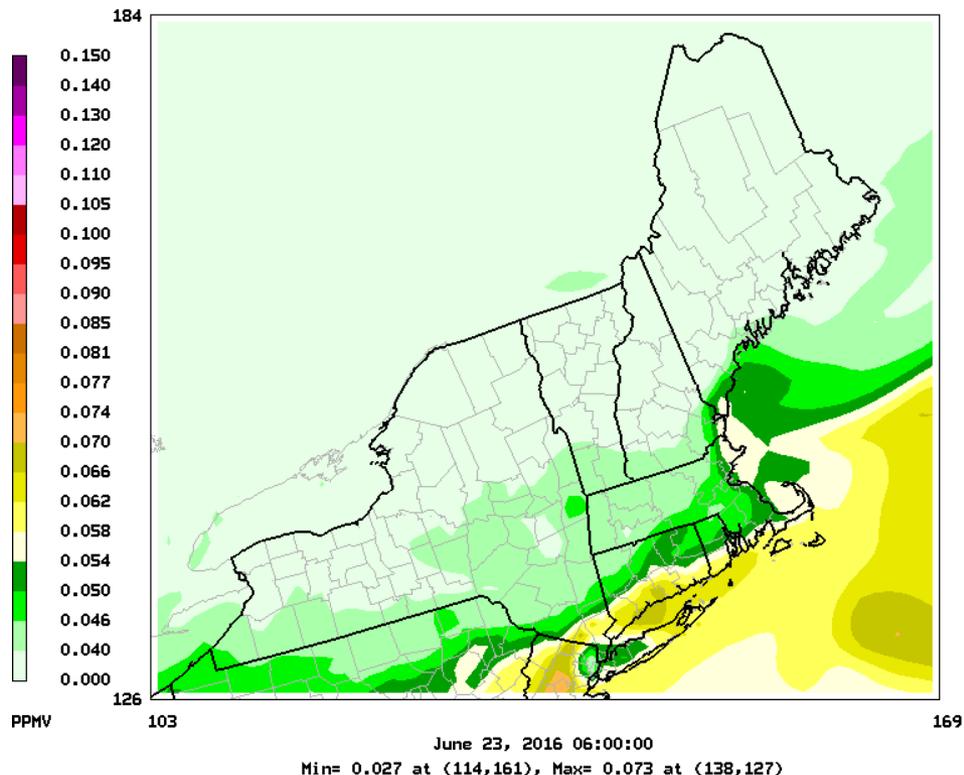


Barons MAQSIP Same Day

24HR Peak 8HR-AVG Ozone -- 15km NES wndw

(c) 2013 BAMS Environmental Modeling Center

15km MAQSIP Domain Initialized 20160623 at 06Z



Conclusion

- Although the NOAA showed good to moderate levels along the CT coast, the stalled warm front moved north and allowed ozone to reach low USG at several sites in CT;
- The 8:00am NOAA run (available at 1:00pm), showed an exceedance at New Haven, but it was too late to forecast.
- Once again, this June weather pattern, which is more indicative of May, has featured an east coast trough with a fast moving jet stream in the vicinity. This makes exact forecasting for fronts and ozone a challenge.

